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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,587	10/17/2001	Yosuke Fujii	SIW-016	7569
959	7590	01/30/2004	EXAMINER	
LAHIVE & COCKFIELD, LLP. 28 STATE STREET BOSTON, MA 02109			RUTHKOSKY, MARK	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/982,587

Applicant(s)

FUJII ET AL.

Examiner

Mark Ruthkosky

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Specification

The examiner approves the amended title of the invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 stands rejected under 35 U.S.C. 102(b) as being anticipated by Davis (GB 2,326,017.) Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipated by Davis (GB 2,326,017.)

The instant claims are to a fuel cell comprising a pair of separators; a membrane electrode assembly (MEA) including an electrolyte membrane and an anode and a cathode disposed at both sides of the electrolyte membrane with the membrane electrode assembly being held by the separators by a sealing member; and a reactant gas channel is disposed between the MEA and of the separators with a part of the reactant gas channel being formed seamlessly by a part of the sealing member.

Davis (GB 2,326,017) teaches a fuel cell assembly including a bipolar plate attached to a membrane electrode assembly (MEA) including an electrolyte membrane and an anode and a cathode disposed at both sides of the electrolyte membrane (see figure 3.) A sealing member

Art Unit: 1745

holds the membrane electrode assembly to the separator. The separator plate is made of a thermoplastic resin and a conductive material, including carbon, metals or plated metal layers, and includes a plurality of grooved channels (page 5) that transfers reactants. The plate may be heat bonded to the electrode. In another embodiment, a layer of a thermoplastic or adhesive may be added to the face of the plate at contact portions to fuse the plate to the anode or cathode (page 6.) The bonding or adhesion of the separator will form a seamless gas channel with the electrode. Thus, the claim is anticipated.

With regard to claim 6, it is noted that the sealing member has an extended portion that is formed along the separator plate and a protruding portion that is formed along the edge of a channel by placing the sealing member along the face of the separator plate. The sealing member will extend the depth of the channel and seal the channel to the electrode (see figure 3, lines 29-30.) Thus, the claim is anticipated.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4 stand rejected under 35 U.S.C. 103(a) as being unpatentable over by Davis (GB 2,326,017) as applied to claim 1 above, and further in view of Nishida (JP 2000-021418.)

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Davis (GB 2,326,017) as applied to claim 1 above, and further in view of Nishida (JP 2000-021418.)

Davis (GB 2,326,017) teaches a fuel cell assembly including a bipolar plate attached to a membrane electrode assembly (MEA) including an electrolyte membrane and an anode and a cathode disposed at both sides of the electrolyte membrane (see figure 3.) A sealing member forming a plurality of gas channels as previously disclosed holds the membrane electrode assembly to the separator. The reference does not teach the separator to be made of a thin metal plate or that a gas channel has a turning portion where a boundary of the turning portion is constituted by the sealing member.

Nishida (JP 2000-021418) teaches a fuel cell including a separator plate attached to a membrane electrode assembly (MEA) including an electrolyte membrane and an anode and a cathode sandwiching the electrolyte membrane (see figure 3.) The separator plate is made of thin metals and includes a plurality of grooved channels (figures) that transfer reactants. A gas guiding phenol groove with a turning portion is disclosed. As the phenol projecting parts form a groove for guiding gas, the material is a sealing member. It would be obvious to one of ordinary skill in the art at the time the invention was made to use a thin metal plate as a separator material of Davis (GB 2,326,017) as the material can be prepared with grooves to form flow channels and the material is also conductive as noted in both references. Further, the plate can have turning portions made of a gas sealing material as noted in Nishida (JP 2000-021418.) One of ordinary skill in the art would recognize that the additions of adhesive or thermoplastic materials to a metal separator plate will further serve to seal the gas channels and fuse the plate to the anode or cathode as taught in Davis (GB 2,326,017.)

With regard to claim 5, Nishida et al. (JP 2000-021418) teaches a turning portion of the grooves in the separator plate. Davis (GB 2,326,017) teaches applying a sealing member to the

Art Unit: 1745

face of the separator plate to adhesively bond the plate to the adjacent electrode and to seal the fuel and oxidant channels (page 3, lines 25-30.) It would be obvious to one of ordinary skill in the art at the time the invention was made to apply a sealing member to the face of a separator in order to seal the face of the separator plate to the adjacent electrode and form sealed fuel and oxidant grooves. This will allow for the reactants to flow through the gas channels and react at the electrode interface without escaping from the gas channel. The artesian would have found the claimed invention to be obvious in light of the teachings of the references.

Response to Arguments

Applicant's arguments filed 10/30/2003 have been fully considered but they are not persuasive. The applicant argues that the Davis reference lacks a teaching or suggestion that a sealing member forms a portion of any of the grooves. The applicant provides an example in Figure 1 wherein adding a sealing member, which is a boundary portion of a reaction channel, forms a groove. This is considered a seamless channel.

The examiner disagrees with the applicant's arguments that Davis lacks a teaching or suggestion that a sealing member forms a portion of any of the grooves. The addition of the sealing material to the face of the separator forms an inherent extension of the groove between the groove walls face that is sealed to the electrode and the electrode itself. The material is added to the face of the separator in the same manner that the sealing material is added to the flat portion of the plate to form a bond between the plate and the electrode in the instant application, as argued. The material of the reference is shown to seal the fuel and oxidant channels on page 3

of the reference. The Davis reference anticipates claim 1, as claimed, as the sealing member disposed between the separator and the MEA forms part of the gas channel seamlessly.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:00.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's

Application/Control Number: 09/982,587

Page 7

Art Unit: 1745

supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number is 703-872-

9306.

Mark Ruthkosky

Primary Patent Examiner

Art Unit 1745

Mark Ruthkosky
11/24/04